AMENDMENTS TO THE CLAIMS

This listing of the claims shall replace all prior versions and listings of the claims in the application:

1. (Currently Amended) ~~A~~ The method of claim 27 further comprising: ~~determining the composition of a material, said method comprising:~~

(i) measuring an attenuation of multiple ultrasonic waves transmitted through the material at multiple frequencies; and

(ii) deriving from the measured attenuations an attenuation curve of the ultrasonic wave attenuation as a function of change in the ultrasonic wave frequency~~;~~.

~~(iii) identifying a shape feature of the attenuation curve related to the composition of the material; and~~

~~(iv) determining the composition of the material from the shape feature.~~

2. (Original) The method of claim 1, wherein the determination of the composition of the material further comprises a determination of a mean particle size of particles in a material suspension.

3. (Original) The method of claim 1, wherein the determination of the composition of the material further comprises a determination of a size range of the largest particles in a material suspension.

4. (Original) The method of claim 1, wherein the determination of the composition of the material further comprises a determination of a component ratio of particles in a material suspension.

5. (Original) The method of claim 2, wherein the shape feature identified to determine the mean particle size in the material suspension is the maximum slope of the attenuation curve near a frequency where the wavenumber *ka* is approximately equal to 1.

6. (Original) The method of claim 3, wherein the shape feature identified to determine the size range of the largest particles in the material suspension is a width of the derivative of the attenuation curve near a frequency where the wavenumber *ka* is approximately equal to 1.

7. (Original) The method of claim 4, wherein the shape feature identified to determine a component ratio of the particles in the material suspension is a maximum value of the attenuation curve near a frequency where the wavenumber *ka* is approximately equal to 1.

8. (Original) The method of claim 1, wherein the determination of the composition of the material is made from a predetermined relationship between material composition and the shape feature of the attenuation curve.

9. (Original) The method of claim 1, wherein the determination of the composition of the material from the shape feature further comprises comparing a known shape feature for a known material to the shape feature from the attenuation curve.

10. (Withdrawn) A method of determining the composition of a material, said method comprising:

(i) measuring a phase of multiple ultrasonic waves transmitted through the material at multiple frequencies;

(ii) deriving from the phase measurements a phase curve of the ultrasonic wave phase as a function of change in the ultrasonic wave frequency;

(iii) identifying a shape feature of the phase curve related to the composition of the material; and

(iv) determining the composition of the material from the shape feature.

11. (Withdrawn) The method of claim 10, wherein the material consists of a suspension of particles associated with a suspending constituent.

12. (Withdrawn) The method of claim 10, wherein the determination of the composition of the material further comprises a determination of a component ratio of particles in a material suspension.

13. (Withdrawn) The method of claim 10, wherein the determination of the composition of the material further comprises a determination of a component ratio among multiple suspending constituents in a material suspension.

14. (Withdrawn) The method of claim 12, wherein the shape feature identified to determine the component ratio of the particles in the material suspension is a slope of the phase curve near a frequency where the wavenumber *ka* is approximately equal to 1.

15. (Withdrawn) The method of claim 13, wherein the shape feature identified to determine the component ratio of the multiple suspending constituents in a material suspension is a constant value from the phase curve below a frequency where the wavenumber *ka* is approximately equal to 1.

16. (Withdrawn) The method of claim 10, wherein the determination of the composition of the material is made from a predetermined relationship between material composition and the shape features of the phase curve.

17. (Withdrawn) The method of claim 10, wherein the determination of the composition of the material from the shape feature further comprises comparing a known shape feature for a known material to the phase curve.

18. (Original) An apparatus for determining the composition of a material, the apparatus comprising:

(i) means for measuring a wave attribute of multiple ultrasonic waves transmitted through a material at multiple frequencies, the wave attribute being selected from a group consisting of an attenuation and a phase of the multiple ultrasonic waves;

(ii) means for deriving a curve of the measured wave attribute as a function of change in the ultrasonic wave frequency;

(iii) means for identifying a shape feature from the curve related to the composition of the material; and

(iv) means for determining the composition of the material from the shape feature.

19. (Original) The apparatus of claim 18, wherein the determination of the composition of the material further comprises a determination of a mean particle size of particles in a material suspension.

20. (Original) The apparatus of claim 18, wherein the determination of the composition of the material further comprises a determination of a size range of the largest particles in a material suspension.

21. (Original) The apparatus of claim 18, wherein the determination of the composition of the material further comprises a determination of a component ratio of particles in a material suspension.

22. (Original) The apparatus of claim 18, wherein the determination of the composition of the material further comprises a determination of a component ratio among multiple suspending constituents in a material suspension.

23. (Original) The apparatus of claim 18, wherein the means for measuring a wave attribute comprises a first ultrasonic transducer transmitting an ultrasonic wave and a second ultrasonic transducer receiving the ultrasonic wave wherein the first

ultrasonic transducer and the second ultrasonic transducer transmit and receive the ultrasonic wave at a select angle of offset relative to a line between transducer centers.

24. (Original) The apparatus of claim 18, wherein the means for measuring a wave attribute comprises an ultrasonic transducer shielded from the material by a protective wall.

25. (Withdrawn) An apparatus for determining the composition of a material in a container, comprising a first ultrasonic transducer transmitting an ultrasonic wave into the material and a second ultrasonic transducer receiving the ultrasonic wave from the material wherein the first ultrasonic transducer and the second ultrasonic transducer transmit and receive the ultrasonic wave at a select angle of offset relative to a line between transducer centers.

26. (Withdrawn) The apparatus of claim 25, wherein one of the first ultrasonic transducer and the second ultrasonic transducer are shielded from the material by a protective wall.

27. (New) A method of determining the composition of a material, said method comprising:

(i) measuring a wave attribute of multiple ultrasonic waves transmitted through a material at multiple frequencies, the wave attribute being selected from a group consisting of an attenuation and a phase of the multiple ultrasonic waves;

(ii) deriving a curve of the measured wave attribute as a function of change in the ultrasonic wave frequency;

(iii) identifying a shape feature from the curve related to the composition of the material; and

(iv) determining the composition of the material from the shape feature.